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55 **Number of Pages (including this page)**

Date: January 12, 2006

To: Examiner Shingles, K.– Group Art Unit 2141

Location: United States Patent and Trademark Office

Fax No.: 571-273-8300

From: Steven A. May (Registration No. 44,912)

Subject: Serial No. 09/447,400 - Chen et al.

MESSAGE:

Enclosed herewith, please find a RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF for filing in the below-identified application.

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EXAMINER:	**Shingles, K.**
GROUP ART UNIT:	2141
SERIAL NO.:	09/447,400
FILED:	11/22/1999
INVENTOR:	Chen et al.
ATTORNEY DOCKET NO.:	CE08051R

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- PATENT -

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Chen et al.	EXAMINER:	Shingles, K.
SERIAL NO.:	09/447,400	ART UNIT:	2141
FILED:	11/22/99	CASE NO.:	CE08051R
ENTITLED:	LOAD BALANCING METHOD IN A COMMUNICATION NETWORK		

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January 12, 2006

APPEAL BRIEF UNDER 37 CFR 41.37

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Commissioner:

The appellants hereby respectfully re-submit the following Appeal Brief in response to a final Office Action, dated May 10, 2005, a Notice of Appeal filed August 8, 2005, a filing of an Appeal Brief on October 10, 2005, and a Notice of Non-Compliant Appeal Brief, dated January 3, 2006.

1. REAL PARTY IN INTEREST

The real party in interest in this appeal is Motorola, Inc.

2. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal.

3. STATUS OF CLAIMS

This is an appeal from a final Office Action, dated May 10, 2005. Claims 1-14 are appealed. In a first Office Action dated August 12, 2002, the Examiner rejected claims 1-4, 7, and 8 under 35 U.S.C. §103(a) as being unpatentable over Dias et al. (U.S. patent no. 6,119,143) in view of Smith (U.S. patent no. 5,835,724). The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Adelman et al. (U.S. patent no. 6,006,259). The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Attanasio et al. (U.S. patent no. 5,918,017) and Fine (U.S. patent no. 4,894,846). The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of the applicants' admitted prior art. The Examiner rejected claims 10-14 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Yu (U.S. patent no. 6,078,943). In a response dated November 12, 2002, the appellants replied to the first Office Action without amending the claims.

In a second Office Action dated January 29, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu (U.S. patent no. 6,078,943) in view of Smith. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu view of Smith and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu view of Smith and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Smith and further in view of

the applicants' admitted prior art. In a response dated April 28, 2003, the appellants replied to the second Office Action without amending the claims.

In a third Office Action dated July 14, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt et al. (U.S. patent no. 6,424,992) and further in view of Devarakonda (U.S. patent no. 6,195,680). The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of the applicants' admitted prior art. In a response dated October 14, 2003, the appellants replied to the third Office Action without amending the claims.

In a fourth Office Action dated December 30, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and further in view of Devarakonda. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and Devarakonda and further in view of Attanasio and Fine The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of the applicants' admitted prior art. In a response dated June 22, 2004, the appellants replied to the fourth Office Action without amending the claims.

In a fifth Office Action dated October 5, 2004, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda

and further in view of the applicants' admitted prior art. In an Amendment dated February 4, 2005, the appellants amended each of claims 1-4.

Claim 1, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into a first and second server groups, wherein the first server group has a load level less than a load level of the second server group, calculating a time period T, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of the time period T, determining another group of servers including the group of servers that includes the first server group and further including the second server group, and assigning load to a server selected from the another group of servers after expiration of the time period T.

Claim 2, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple into multiple server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating time periods T1 and T2, wherein the time period T2 is longer than the time period T1, assigning load to a server selected from a group of servers comprising the server group G0 from an initial time until expiration of the time period T1, determining another group of servers comprising the group of servers that includes the server group G0 and further comprising the server group G1, assigning load to a server selected from the another group of servers after expiration of the time period T1, determining yet another group of servers comprising the group of servers that includes the another group of servers and further comprising the server group G2, and assigning load to a server selected from the yet another group of servers after expiration of the time period T2.

Claim 3, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method

including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers.

Claim 4, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in said communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk corresponding to the server groups G1 through Gk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers, wherein each group of servers of the other groups of servers corresponds to an expiring time period.

In a final Office Action dated May 10, 2005, the Examiner rejected claims 8 and 9 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claims the subject matter which the applicant regards as the

invention, in particular as lacking an antecedent basis for the phrase "said combination." The Examiner rejected claims 1-10 under 35 U.S.C. §102(e) as being anticipated by Jindal et al. (U.S. patent no. 6,327,622, hereinafter referred to as "Jindal"). The Examiner rejected claims 11-14 under 35 U.S.C. §103(a) as being unpatentable over Jindal in view of Couland et al. (U.S. patent no. 6,253,230). No claims were allowed. The pending claims 1-14 are reproduced below in the attached Appendix.

An Amendment and Response to the Final Office Action was filed on August 8, 2005. The appellants received an Advisory Action, dated September 1, 2005, filed a Notice of Appeal on August 8, 2005, filed an Appeal Brief on October 10, 2005, and received a Notice of Non-Compliant Appeal Brief, dated January 3, 2006. The Notice of Non-Compliant Appeal Brief objected to the absence of an Evidence Appendix and a Related Proceedings Appendix in the Appeal Brief. In order to comply with the Examiner's objections, such appendices have been added to the re-submitted Appeal Brief.

4. STATUS OF AMENDMENTS

An Amendment and Response to the Final Office Action was filed on August 8, 2005, and is currently pending. In the Response to the Final Office Action, the appellants amended claims 8 and 9 and responded to the Examiner's rejection of claims 1-14. The appellants received an Advisory Action, dated September 1, 2005. The Advisory Action reiterated the rejections of claims 1-14 under the cited prior art.

5. SUMMARY OF INVENTION

The appellant's invention provides a method and apparatus for load balancing by assigning load in a communication system network having multiple servers, each server having a load level based on serving a number of clients.

Claim 1, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into a first and second server groups, wherein the

first server group has a load level less than a load level of the second server group, calculating a time period T, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of the time period T, determining another group of servers including the group of servers that includes the first server group and further including the second server group, and assigning load to a server selected from the another group of servers after expiration of the time period T. (FIG. 5; pages 19-20; pages 25-26)

Claim 2, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple into multiple server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating time periods T1 and T2, wherein the time period T2 is longer than the time period T1, assigning load to a server selected from a group of servers comprising the server group G0 from an initial time until expiration of the time period T1, determining another group of servers comprising the group of servers that includes the server group G0 and further comprising the server group G1, assigning load to a server selected from the another group of servers after expiration of the time period T1, determining yet another group of servers comprising the group of servers that includes the another group of servers and further comprising the server group G2, and assigning load to a server selected from the yet another group of servers after expiration of the time period T2. (FIG. 5; pages 20-21; pages 25-26)

Claim 3, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple

other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers. (FIG. 5; page 21; pages 25-26)

Claim 4, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in said communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk corresponding to the server groups G1 through Gk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers, wherein each group of servers of the other groups of servers corresponds to an expiring time period. (FIG. 5; page 22; pages 25-26)

6. ISSUES

Whether claims 1-4 are unpatentable under 35 U.S.C. §35 U.S.C. §102(e) as being anticipated by Jindal.

7. GROUPING OF CLAIMS

Appellants designate the following group of claims:

Group I: claims 1-14.

8. ARGUMENT

(i) Rejection under 35 U.S.C. §112, first paragraph:

None

(ii) Rejection under 35 U.S.C. §112, second paragraph:

None

(iii) Rejection under 35 U.S.C. §102:

The Examiner rejected claims 1-10 under 35 U.S.C. §102(e) as being anticipated by Jindal. With respect to claim 1, the Examiner stated that Jindal teaches grouping multiple servers into first and second server groups, wherein said first server group has a load level less than a load level of said second server group (col. 9, line 48 to col. 10, line 40) calculating a time period T (col. 2 lines 40-67; col. 4, lines 57-67; col. 6, lines 35-64; col. 8, lines 1-7 and 47-54; and col. 9, line 14-27), assigning load to a server selected from a group of servers comprising said first server group from an initial time until expiration of said time period T (col. 4, lines 57-67; col. 6, lines 35-64; and col. 9, line 14-27), determining another group of servers comprising said group of servers that includes said first server group and further comprising said second server group (col. 8, line 55 to col. 10, line 40), and assigning load to a server selected from said another group of servers after expiration of said time period T (col. 4, lines 57-67; col. 6, lines 35-64; col. 8, lines 1-7 and 47-54; and col. 9, line 14-27).

The appellants respectfully disagree with the Examiner's interpretation of Jindal. Jindal teaches a selection and subsequent re-selection of a server from a same group of servers. That is, Jindal teaches a central server that periodically determines a server from a same group of servers to be the "preferred" server to which client requests are routed. In order to select the preferred server, the central server periodically collects one or more items of information concerning each server in the group, such as a number of clients being serviced by the server at that moment, a number of client requests handled by the

server in a predetermined period of time, and a distance of the server from the central server. Based on the collected information, the central server then selects a server from the group of servers to be the preferred server. The group of servers may comprise multiple servers directly connected to the central server (servers 110, 112, and 114 in FIG. 2), or the group of servers may comprise multiple servers that are indirectly connected to the central server (servers 302, 304, 312, and 314, which are connected to central server 100 via intermediate servers 306 and 316 in FIG. 3, that is, the 'server farms' referenced by the Examiner in the Advisory Action). However, in both instances, at each server selection point the preferred server is selected by the central server from the same group of servers. Thus load balancing is performed not by varying the groups of servers analyzed but instead by periodically analyzing each server in a same group of servers.

In the Advisory Action, the Examiner referenced column 10, lines 32-40, of Jindal as teaching the segregation of servers into multiple groups. The appellants respectfully disagree. In this section of Jindal, Jindal merely teaches that the server group may comprise individual, participating servers ('segregated' servers) distributed among separate 'server farms,' rather than all the servers of each of one or more 'farms.' These individual servers may be considered something of a virtual group. Jindal then teaches that each farm, upon receiving a load allocation for the participating servers of that farm and which load allocation is based on a 'global' load distribution policy, may then distribute load to the participating servers of that farm based on a different load distribution policy than the 'global' load distribution policy. However, again, at each selection point, the load is being distributed among the same participating servers, that is, among the members of the virtual group.

By contrast, claim 1 teaches load balancing by varying the groups of servers considered. That is, claim 1 teaches grouping multiple servers into a first and second server groups, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of a time period T, determining another group of servers comprising the group of servers that includes the first server group and further comprising the second server group, and assigning load to a server

selected from the another group of servers after expiration of the time period T. Nowhere does Jindal teach such load balancing. Accordingly, the appellants respectfully submit that claim 1 is not unpatentable over the prior art of record.

Each of claims 2-4 includes limitations of assigning load to a server selected from a group of servers comprising a first server group from an initial time until expiration of said time period T, determining multiple other groups of servers comprising the group of servers that includes the first server group and further comprising another server group of multiple other servers groups, and assigning load to a server selected from a group of servers of the multiple other groups of servers after expiration of said time period T. As noted above, none of these limitations are taught by Jindal. Accordingly, the appellants respectfully submit that claims 2-4 are not unpatentable over the prior art of record.

Regarding dependent claims 5-14, because claims 5-14 depend directly or indirectly from independent claim 4, the appellants respectfully submit that claims 5-14 are not unpatentable over the prior art of record.

(iv) Rejection under 35 U.S.C. §103:

None.

(v) Other rejections

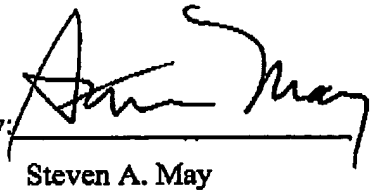
None.

8. CONCLUSION

For the above reasons, the appellants respectfully submit that the rejection of claims 1-14 under 35 U.S.C. §102(e) as being upatentable over Jindal is in error and should be reversed and the claims allowed.

Respectfully submitted,

David Chen, et al.

By: 

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CLAIMS APPENDIX

1. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a first and second server groups, wherein said first server group has a load level less than a load level of said second server group;

calculating a time period T;

assigning load to a server selected from a group of servers comprising said first server group from an initial time until expiration of said time period T;

determining another group of servers comprising said group of servers that includes said first server group and further comprising said second server group; and

assigning load to a server selected from said another group of servers after expiration of said time period T.

2. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level;

calculating time periods T1 and T2, wherein said time period T2 is longer than said time period T1;

assigning load to a server selected from a group of servers comprising said server group G0 from an initial time until expiration of said time period T1;

determining another group of servers comprising said group of servers that includes said server group G0 and further comprising said server group G1;

assigning load to a server selected from said another group of servers after expiration of said time period T1;

determining yet another group of servers comprising said group of servers that includes said another group of servers and further comprising said server group G2; and

assigning load to a server selected from said yet another group of servers after expiration of said time period T2.

3. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through Gk, wherein said server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level;

calculating a plurality of time periods T1 through Tk;

assigning load to a server selected from servers in said server group G0 from an initial time until expiration of said time period T1;

determining a plurality of other groups of servers, wherein each group of servers of said plurality of other groups of servers comprises said group of servers that includes said server group G0 and further comprises at least one other server group selected from said server groups G1 through Gk; and

assigning load, after expiration of each of said time periods T1 through Tk measured from said initial time, to a server selected from a group of servers of the plurality of other groups of servers.

4. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through Gk, wherein said server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level;

calculating a plurality of time periods T1 through Tk corresponding to said server groups G1 through Gk;

assigning load to a server selected from servers in said server group G0 from an initial time until expiration of said time period T1;

determining a plurality of other groups of servers, wherein each group of servers of said plurality of other groups of servers comprises said group of servers that includes said server group G0 and further comprises at least one other server group selected from said server groups G1 through Gk; and

assigning load, after expiration of each of said time periods T1 through Tk measured from said initial time, to a server selected from a group of servers of the plurality of other groups of servers, wherein each group of servers of said other groups of servers corresponds to an expiring time period.

5. The method as recited in claim 4 wherein said plurality of time periods T1 through Tk each is based on a difference between load levels of at least two server groups in said plurality of server groups G0 through Gk.

6. The method as recited in claim 4 further comprising the step of:

receiving an update of load level of at least one of said plurality of servers in said plurality of server groups G0 through Gk;

repeating said grouping to produce a new plurality of server groups G0 through Gk based on said update of load level;

repeating said calculating said plurality of time periods to produce a new plurality of time periods T1 through Tk corresponding to said new plurality of server groups G0 through Gk;

resetting said initial time to a reset initial time, and assigning load to a server selected from servers in said new server group G0 from said reset initial time until expiration of said new time period T1;

assigning load, after expiration of each of said new time periods T1 through Tk measured from said reset initial time, to a server selected from servers in a combination of servers including said new server group G0 and at least one other server group, in said new server groups G1 through Gk, corresponding to an expiring time period.

7. The method as recited in claim 4 wherein said grouping of said plurality of server groups G0 through Gk is based on similarity of load levels among said plurality of servers.

8. The method as recited in claim 4 wherein at least one load assignment in said assigning load to a server in said server group G0 and said assigning load to a server selected from a group of servers of the plurality of other groups of servers is performed according to a round robin selection method.

9. The method as recited in claim 4 wherein at least one load assignment in said assigning load to a server in said server group G0 and said assigning load to a server selected from a group of servers of the plurality of other groups of servers is performed according to a random selection method.

10. The method as recited in claim 4 wherein each of said plurality of time periods T1 through Tk is based on load levels of at least two server groups selected from said plurality of server groups G0 through Gk, a request arrival rate and a server service rate.

11. The method as recited in claim 10 wherein said request arrival rate is substituted for an average request arrival rate of said plurality of servers.

12. The method as recited in claim 10 wherein said request arrival rate is substituted for an average request arrival rate of a combination of servers of said plurality of servers.

13. The method as recited in claim 10 wherein said server service rate is substituted for an average service rate of said plurality of servers.

14. The method as recited in claim 10 wherein said server service rate is substituted for an average service rate of a combination of servers of said plurality of servers.

EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132, nor has any other evidence been entered by the Examiner and relied upon by the appellant.

RELATED PROCEEDINGS APPENDIX

The appellants and appellants' representative know of no other appeal, interference, or judicial proceeding that may be related to, directly affect or be directly affected by, or have a bearing upon the Board's decision in the pending appeal.

- PATENT -

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Chen et al.	EXAMINER:	Shingles, K.
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ENTITLED:	LOAD BALANCING METHOD IN A COMMUNICATION NETWORK		

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January 12, 2006

APPEAL BRIEF UNDER 37 CFR 41.37

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P.O. Box 1450
Alexandria, Va. 22313-1450

Commissioner:

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1. REAL PARTY IN INTEREST

The real party in interest in this appeal is Motorola, Inc.

2. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal.

3. STATUS OF CLAIMS

This is an appeal from a final Office Action, dated May 10, 2005. Claims 1-14 are appealed. In a first Office Action dated August 12, 2002, the Examiner rejected claims 1-4, 7, and 8 under 35 U.S.C. §103(a) as being unpatentable over Dias et al. (U.S. patent no. 6,119,143) in view of Smith (U.S. patent no. 5,835,724). The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Adelman et al. (U.S. patent no. 6,006,259). The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Attanasio et al. (U.S. patent no. 5,918,017) and Fine (U.S. patent no. 4,894,846). The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of the applicants' admitted prior art. The Examiner rejected claims 10-14 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Yu (U.S. patent no. 6,078,943). In a response dated November 12, 2002, the appellants replied to the first Office Action without amending the claims.

In a second Office Action dated January 29, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu (U.S. patent no. 6,078,943) in view of Smith. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu view of Smith and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu view of Smith and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Smith and further in view of

the applicants' admitted prior art. In a response dated April 28, 2003, the appellants replied to the second Office Action without amending the claims.

In a third Office Action dated July 14, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt et al. (U.S. patent no. 6,424,992) and further in view of Devarakonda (U.S. patent no. 6,195,680). The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of the applicants' admitted prior art. In a response dated October 14, 2003, the appellants replied to the third Office Action without amending the claims.

In a fourth Office Action dated December 30, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and further in view of Devarakonda. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and Devarakonda and further in view of Attanasio and Fine The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of the applicants' admitted prior art. In a response dated June 22, 2004, the appellants replied to the fourth Office Action without amending the claims.

In a fifth Office Action dated October 5, 2004, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda

and further in view of the applicants' admitted prior art. In an Amendment dated February 4, 2005, the appellants amended each of claims 1-4.

Claim 1, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into a first and second server groups, wherein the first server group has a load level less than a load level of the second server group, calculating a time period T, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of the time period T, determining another group of servers including the group of servers that includes the first server group and further including the second server group, and assigning load to a server selected from the another group of servers after expiration of the time period T.

Claim 2, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple into multiple server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating time periods T1 and T2, wherein the time period T2 is longer than the time period T1, assigning load to a server selected from a group of servers comprising the server group G0 from an initial time until expiration of the time period T1, determining another group of servers comprising the group of servers that includes the server group G0 and further comprising the server group G1, assigning load to a server selected from the another group of servers after expiration of the time period T1, determining yet another group of servers comprising the group of servers that includes the another group of servers and further comprising the server group G2, and assigning load to a server selected from the yet another group of servers after expiration of the time period T2.

Claim 3, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method

including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers.

Claim 4, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in said communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk corresponding to the server groups G1 through Gk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers, wherein each group of servers of the other groups of servers corresponds to an expiring time period.

In a final Office Action dated May 10, 2005, the Examiner rejected claims 8 and 9 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claims the subject matter which the applicant regards as the

invention, in particular as lacking an antecedent basis for the phrase "said combination." The Examiner rejected claims 1-10 under 35 U.S.C. §102(e) as being anticipated by Jindal et al. (U.S. patent no. 6,327,622, hereinafter referred to as "Jindal"). The Examiner rejected claims 11-14 under 35 U.S.C. §103(a) as being unpatentable over Jindal in view of Couland et al. (U.S. patent no. 6,253,230). No claims were allowed. The pending claims 1-14 are reproduced below in the attached Appendix.

An Amendment and Response to the Final Office Action was filed on August 8, 2005. The appellants received an Advisory Action, dated September 1, 2005, filed a Notice of Appeal on August 8, 2005, filed an Appeal Brief on October 10, 2005, and received a Notice of Non-Compliant Appeal Brief, dated January 3, 2006. The Notice of Non-Compliant Appeal Brief objected to the absence of an Evidence Appendix and a Related Proceedings Appendix in the Appeal Brief. In order to comply with the Examiner's objections, such appendices have been added to the re-submitted Appeal Brief.

4. STATUS OF AMENDMENTS

An Amendment and Response to the Final Office Action was filed on August 8, 2005, and is currently pending. In the Response to the Final Office Action, the appellants amended claims 8 and 9 and responded to the Examiner's rejection of claims 1-14. The appellants received an Advisory Action, dated September 1, 2005. The Advisory Action reiterated the rejections of claims 1-14 under the cited prior art.

5. SUMMARY OF INVENTION

The appellant's invention provides a method and apparatus for load balancing by assigning load in a communication system network having multiple servers, each server having a load level based on serving a number of clients.

Claim 1, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into a first and second server groups, wherein the

first server group has a load level less than a load level of the second server group, calculating a time period T, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of the time period T, determining another group of servers including the group of servers that includes the first server group and further including the second server group, and assigning load to a server selected from the another group of servers after expiration of the time period T. (FIG. 5; pages 19-20; pages 25-26)

Claim 2, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple into multiple server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating time periods T1 and T2, wherein the time period T2 is longer than the time period T1, assigning load to a server selected from a group of servers comprising the server group G0 from an initial time until expiration of the time period T1, determining another group of servers comprising the group of servers that includes the server group G0 and further comprising the server group G1, assigning load to a server selected from the another group of servers after expiration of the time period T1, determining yet another group of servers comprising the group of servers that includes the another group of servers and further comprising the server group G2, and assigning load to a server selected from the yet another group of servers after expiration of the time period T2. (FIG. 5; pages 20-21; pages 25-26)

Claim 3, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple

other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers. (FIG. 5; page 21; pages 25-26)

Claim 4, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in said communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk corresponding to the server groups G1 through Gk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers, wherein each group of servers of the other groups of servers corresponds to an expiring time period. (FIG. 5; page 22; pages 25-26)

6. ISSUES

Whether claims 1-4 are unpatentable under 35 U.S.C. §35 U.S.C. §102(e) as being anticipated by Jindal.

7. GROUPING OF CLAIMS

Appellants designate the following group of claims:

Group I: claims 1-14.

8. ARGUMENT

(i) Rejection under 35 U.S.C. §112, first paragraph:

None

(ii) Rejection under 35 U.S.C. §112, second paragraph:

None

(iii) Rejection under 35 U.S.C. §102:

The Examiner rejected claims 1-10 under 35 U.S.C. §102(e) as being anticipated by Jindal. With respect to claim 1, the Examiner stated that Jindal teaches grouping multiple servers into first and second server groups, wherein said first server group has a load level less than a load level of said second server group (col. 9, line 48 to col. 10, line 40) calculating a time period T (col. 2 lines 40-67; col. 4, lines 57-67; col. 6, lines 35-64; col. 8, lines 1-7 and 47-54; and col. 9, line 14-27), assigning load to a server selected from a group of servers comprising said first server group from an initial time until expiration of said time period T (col. 4, lines 57-67; col. 6, lines 35-64; and col. 9, line 14-27), determining another group of servers comprising said group of servers that includes said first server group and further comprising said second server group (col. 8, line 55 to col. 10, line 40), and assigning load to a server selected from said another group of servers after expiration of said time period T (col. 4, lines 57-67; col. 6, lines 35-64; col. 8, lines 1-7 and 47-54; and col. 9, line 14-27).

The appellants respectfully disagree with the Examiner's interpretation of Jindal. Jindal teaches a selection and subsequent re-selection of a server from a same group of servers. That is, Jindal teaches a central server that periodically determines a server from a same group of servers to be the "preferred" server to which client requests are routed. In order to select the preferred server, the central server periodically collects one or more items of information concerning each server in the group, such as a number of clients being serviced by the server at that moment, a number of client requests handled by the

server in a predetermined period of time, and a distance of the server from the central server. Based on the collected information, the central server then selects a server from the group of servers to be the preferred server. The group of servers may comprise multiple servers directly connected to the central server (servers 110, 112, and 114 in FIG. 2), or the group of servers may comprise multiple servers that are indirectly connected to the central server (servers 302, 304, 312, and 314, which are connected to central server 100 via intermediate servers 306 and 316 in FIG. 3, that is, the 'server farms' referenced by the Examiner in the Advisory Action). However, in both instances, at each server selection point the preferred server is selected by the central server from the same group of servers. Thus load balancing is performed not by varying the groups of servers analyzed but instead by periodically analyzing each server in a same group of servers.

In the Advisory Action, the Examiner referenced column 10, lines 32-40, of Jindal as teaching the segregation of servers into multiple groups. The appellants respectfully disagree. In this section of Jindal, Jindal merely teaches that the server group may comprise individual, participating servers ('segregated' servers) distributed among separate 'server farms,' rather than all the servers of each of one or more 'farms.' These individual servers may be considered something of a virtual group. Jindal then teaches that each farm, upon receiving a load allocation for the participating servers of that farm and which load allocation is based on a 'global' load distribution policy, may then distribute load to the participating servers of that farm based on a different load distribution policy than the 'global' load distribution policy. However, again, at each selection point, the load is being distributed among the same participating servers, that is, among the members of the virtual group.

By contrast, claim 1 teaches load balancing by varying the groups of servers considered. That is, claim 1 teaches grouping multiple servers into a first and second server groups, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of a time period T, determining another group of servers comprising the group of servers that includes the first server group and further comprising the second server group, and assigning load to a server

selected from the another group of servers after expiration of the time period T. Nowhere does Jindal teach such load balancing. Accordingly, the appellants respectfully submit that claim 1 is not unpatentable over the prior art of record.

Each of claims 2-4 includes limitations of assigning load to a server selected from a group of servers comprising a first server group from an initial time until expiration of said time period T, determining multiple other groups of servers comprising the group of servers that includes the first server group and further comprising another server group of multiple other servers groups, and assigning load to a server selected from a group of servers of the multiple other groups of servers after expiration of said time period T. As noted above, none of these limitations are taught by Jindal. Accordingly, the appellants respectfully submit that claims 2-4 are not unpatentable over the prior art of record.

Regarding dependent claims 5-14, because claims 5-14 depend directly or indirectly from independent claim 4, the appellants respectfully submit that claims 5-14 are not unpatentable over the prior art of record.

(iv) Rejection under 35 U.S.C. §103:

None.

(v) Other rejections

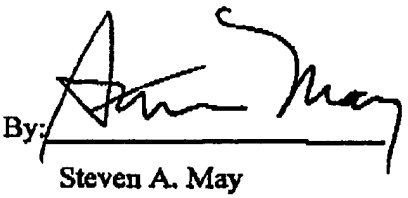
None.

8. CONCLUSION

For the above reasons, the appellants respectfully submit that the rejection of claims 1-14 under 35 U.S.C. §102(e) as being upatentable over Jindal is in error and should be reversed and the claims allowed.

Respectfully submitted,

David Chen, et al.

By: 

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CLAIMS APPENDIX

1. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a first and second server groups, wherein said first server group has a load level less than a load level of said second server group;

calculating a time period T;

assigning load to a server selected from a group of servers comprising said first server group from an initial time until expiration of said time period T;

determining another group of servers comprising said group of servers that includes said first server group and further comprising said second server group; and

assigning load to a server selected from said another group of servers after expiration of said time period T.

2. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level;

calculating time periods T1 and T2, wherein said time period T2 is longer than said time period T1;

assigning load to a server selected from a group of servers comprising said server group G0 from an initial time until expiration of said time period T1;

determining another group of servers comprising said group of servers that includes said server group G0 and further comprising said server group G1;

assigning load to a server selected from said another group of servers after expiration of said time period T1;

determining yet another group of servers comprising said group of servers that includes said another group of servers and further comprising said server group G2; and

assigning load to a server selected from said yet another group of servers after expiration of said time period T2.

3. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through Gk, wherein said server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level;

calculating a plurality of time periods T1 through Tk;

assigning load to a server selected from servers in said server group G0 from an initial time until expiration of said time period T1;

determining a plurality of other groups of servers, wherein each group of servers of said plurality of other groups of servers comprises said group of servers that includes said server group G0 and further comprises at least one other server group selected from said server groups G1 through Gk; and

assigning load, after expiration of each of said time periods T1 through Tk measured from said initial time, to a server selected from a group of servers of the plurality of other groups of servers.

4. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through Gk, wherein said server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level;

calculating a plurality of time periods T1 through Tk corresponding to said server groups G1 through Gk;

assigning load to a server selected from servers in said server group G0 from an initial time until expiration of said time period T1;

determining a plurality of other groups of servers, wherein each group of servers of said plurality of other groups of servers comprises said group of servers that includes said server group G0 and further comprises at least one other server group selected from said server groups G1 through Gk; and

assigning load, after expiration of each of said time periods T1 through Tk measured from said initial time, to a server selected from a group of servers of the plurality of other groups of servers, wherein each group of servers of said other groups of servers corresponds to an expiring time period.

5. The method as recited in claim 4 wherein said plurality of time periods T1 through Tk each is based on a difference between load levels of at least two server groups in said plurality of server groups G0 through Gk.

6. The method as recited in claim 4 further comprising the step of:

receiving an update of load level of at least one of said plurality of servers in said plurality of server groups G0 through Gk;

repeating said grouping to produce a new plurality of server groups G0 through Gk based on said update of load level;

repeating said calculating said plurality of time periods to produce a new plurality of time periods T1 through Tk corresponding to said new plurality of server groups G0 through Gk;

resetting said initial time to a reset initial time, and assigning load to a server selected from servers in said new server group G0 from said reset initial time until expiration of said new time period T1;

assigning load, after expiration of each of said new time periods T1 through Tk measured from said reset initial time, to a server selected from servers in a combination of servers including said new server group G0 and at least one other server group, in said new server groups G1 through Gk, corresponding to an expiring time period.

7. The method as recited in claim 4 wherein said grouping of said plurality of server groups G0 through Gk is based on similarity of load levels among said plurality of servers.

8. The method as recited in claim 4 wherein at least one load assignment in said assigning load to a server in said server group G0 and said assigning load to a server selected from a group of servers of the plurality of other groups of servers is performed according to a round robin selection method.

9. The method as recited in claim 4 wherein at least one load assignment in said assigning load to a server in said server group G0 and said assigning load to a server selected from a group of servers of the plurality of other groups of servers is performed according to a random selection method.

10. The method as recited in claim 4 wherein each of said plurality of time periods T1 through Tk is based on load levels of at least two server groups selected from said plurality of server groups G0 through Gk, a request arrival rate and a server service rate.

11. The method as recited in claim 10 wherein said request arrival rate is substituted for an average request arrival rate of said plurality of servers.

12. The method as recited in claim 10 wherein said request arrival rate is substituted for an average request arrival rate of a combination of servers of said plurality of servers.

13. The method as recited in claim 10 wherein said server service rate is substituted for an average service rate of said plurality of servers.

14. The method as recited in claim 10 wherein said server service rate is substituted for an average service rate of a combination of servers of said plurality of servers.

EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132, nor has any other evidence been entered by the Examiner and relied upon by the appellant.

RELATED PROCEEDINGS APPENDIX

The appellants and appellants' representative know of no other appeal, interference, or judicial proceeding that may be related to, directly affect or be directly affected by, or have a bearing upon the Board's decision in the pending appeal.

- PATENT -

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Chen et al.	EXAMINER:	Shingles, K.
SERIAL NO.:	09/447,400	ART UNIT:	2141
FILED:	11/22/99	CASE NO.:	CE08051R
ENTITLED:	LOAD BALANCING METHOD IN A COMMUNICATION NETWORK		

Motorola, Inc.
Corporate Offices
1303 E. Algonquin Road
Schaumburg, IL 60196
January 12, 2006

APPEAL BRIEF UNDER 37 CFR 41.37

Mail Stop Appeal Brief - Patents
Commissioner of Patents
P.O. Box 1450
Alexandria, Va. 22313-1450

Commissioner:

The appellants hereby respectfully re-submit the following Appeal Brief in response to a final Office Action, dated May 10, 2005, a Notice of Appeal filed August 8, 2005, a filing of an Appeal Brief on October 10, 2005, and a Notice of Non-Compliant Appeal Brief, dated January 3, 2006.

1. REAL PARTY IN INTEREST

The real party in interest in this appeal is Motorola, Inc.

2. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal.

3. STATUS OF CLAIMS

This is an appeal from a final Office Action, dated May 10, 2005. Claims 1-14 are appealed. In a first Office Action dated August 12, 2002, the Examiner rejected claims 1-4, 7, and 8 under 35 U.S.C. §103(a) as being unpatentable over Dias et al. (U.S. patent no. 6,119,143) in view of Smith (U.S. patent no. 5,835,724). The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Adelman et al. (U.S. patent no. 6,006,259). The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Attanasio et al. (U.S. patent no. 5,918,017) and Fine (U.S. patent no. 4,894,846). The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of the applicants' admitted prior art. The Examiner rejected claims 10-14 under 35 U.S.C. §103(a) as being unpatentable over Dias in view of Smith and further in view of Yu (U.S. patent no. 6,078,943). In a response dated November 12, 2002, the appellants replied to the first Office Action without amending the claims.

In a second Office Action dated January 29, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu (U.S. patent no. 6,078,943) in view of Smith. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu view of Smith and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu view of Smith and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Smith and further in view of

the applicants' admitted prior art. In a response dated April 28, 2003, the appellants replied to the second Office Action without amending the claims.

In a third Office Action dated July 14, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt et al. (U.S. patent no. 6,424,992) and further in view of Devarakonda (U.S. patent no. 6,195,680). The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of the applicants' admitted prior art. In a response dated October 14, 2003, the appellants replied to the third Office Action without amending the claims.

In a fourth Office Action dated December 30, 2003, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and further in view of Devarakonda. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Dias and Devarakonda and further in view of Attanasio and Fine The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Goldszmidt and Devarakonda and further in view of the applicants' admitted prior art. In a response dated June 22, 2004, the appellants replied to the fourth Office Action without amending the claims.

In a fifth Office Action dated October 5, 2004, the Examiner rejected claims 1-4, 7, 8, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda. The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda and further in view of Adelman. The Examiner rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda and further in view of Attanasio and Fine. The Examiner rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Yu in view of Devarakonda

and further in view of the applicants' admitted prior art. In an Amendment dated February 4, 2005, the appellants amended each of claims 1-4.

Claim 1, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into a first and second server groups, wherein the first server group has a load level less than a load level of the second server group, calculating a time period T, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of the time period T, determining another group of servers including the group of servers that includes the first server group and further including the second server group, and assigning load to a server selected from the another group of servers after expiration of the time period T.

Claim 2, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple into multiple server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating time periods T1 and T2, wherein the time period T2 is longer than the time period T1, assigning load to a server selected from a group of servers comprising the server group G0 from an initial time until expiration of the time period T1, determining another group of servers comprising the group of servers that includes the server group G0 and further comprising the server group G1, assigning load to a server selected from the another group of servers after expiration of the time period T1, determining yet another group of servers comprising the group of servers that includes the another group of servers and further comprising the server group G2, and assigning load to a server selected from the yet another group of servers after expiration of the time period T2.

Claim 3, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method

including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers.

Claim 4, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in said communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk corresponding to the server groups G1 through Gk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers, wherein each group of servers of the other groups of servers corresponds to an expiring time period.

In a final Office Action dated May 10, 2005, the Examiner rejected claims 8 and 9 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claims the subject matter which the applicant regards as the

invention, in particular as lacking an antecedent basis for the phrase "said combination." The Examiner rejected claims 1-10 under 35 U.S.C. §102(e) as being anticipated by Jindal et al. (U.S. patent no. 6,327,622, hereinafter referred to as "Jindal"). The Examiner rejected claims 11-14 under 35 U.S.C. §103(a) as being unpatentable over Jindal in view of Couland et al. (U.S. patent no. 6,253,230). No claims were allowed. The pending claims 1-14 are reproduced below in the attached Appendix.

An Amendment and Response to the Final Office Action was filed on August 8, 2005. The appellants received an Advisory Action, dated September 1, 2005, filed a Notice of Appeal on August 8, 2005, filed an Appeal Brief on October 10, 2005, and received a Notice of Non-Compliant Appeal Brief, dated January 3, 2006. The Notice of Non-Compliant Appeal Brief objected to the absence of an Evidence Appendix and a Related Proceedings Appendix in the Appeal Brief. In order to comply with the Examiner's objections, such appendices have been added to the re-submitted Appeal Brief.

4. STATUS OF AMENDMENTS

An Amendment and Response to the Final Office Action was filed on August 8, 2005, and is currently pending. In the Response to the Final Office Action, the appellants amended claims 8 and 9 and responded to the Examiner's rejection of claims 1-14. The appellants received an Advisory Action, dated September 1, 2005. The Advisory Action reiterated the rejections of claims 1-14 under the cited prior art.

5. SUMMARY OF INVENTION

The appellant's invention provides a method and apparatus for load balancing by assigning load in a communication system network having multiple servers, each server having a load level based on serving a number of clients.

Claim 1, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into a first and second server groups, wherein the

first server group has a load level less than a load level of the second server group, calculating a time period T, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of the time period T, determining another group of servers including the group of servers that includes the first server group and further including the second server group, and assigning load to a server selected from the another group of servers after expiration of the time period T. (FIG. 5; pages 19-20; pages 25-26)

Claim 2, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple into multiple server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating time periods T1 and T2, wherein the time period T2 is longer than the time period T1, assigning load to a server selected from a group of servers comprising the server group G0 from an initial time until expiration of the time period T1, determining another group of servers comprising the group of servers that includes the server group G0 and further comprising the server group G1, assigning load to a server selected from the another group of servers after expiration of the time period T1, determining yet another group of servers comprising the group of servers that includes the another group of servers and further comprising the server group G2, and assigning load to a server selected from the yet another group of servers after expiration of the time period T2. (FIG. 5; pages 20-21; pages 25-26)

Claim 3, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in the communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple

other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers. (FIG. 5; page 21; pages 25-26)

Claim 4, as amended, provides a method for assigning load in a communication system network having multiple servers, each of the multiple servers having a load level based on serving a number of clients in said communication system network, the method including grouping the multiple servers into multiple server groups G0 through Gk, wherein the server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level, calculating multiple time periods T1 through Tk corresponding to the server groups G1 through Gk, assigning load to a server selected from servers in the server group G0 from an initial time until expiration of the time period T1, determining multiple other groups of servers, wherein each group of servers of the multiple other groups of servers comprises the group of servers that includes the server group G0 and further comprises at least one other server group selected from the server groups G1 through Gk, and assigning load, after expiration of each of the time periods T1 through Tk measured from the initial time, to a server selected from a group of servers of the multiple other groups of servers, wherein each group of servers of the other groups of servers corresponds to an expiring time period. (FIG. 5; page 22; pages 25-26)

6. ISSUES

Whether claims 1-4 are unpatentable under 35 U.S.C. §35 U.S.C. §102(e) as being anticipated by Jindal.

7. GROUPING OF CLAIMS

Appellants designate the following group of claims:

Group I: claims 1-14.

8. ARGUMENT

(i) Rejection under 35 U.S.C. §112, first paragraph:

None

(ii) Rejection under 35 U.S.C. §112, second paragraph:

None

(iii) Rejection under 35 U.S.C. §102:

The Examiner rejected claims 1-10 under 35 U.S.C. §102(e) as being anticipated by Jindal. With respect to claim 1, the Examiner stated that Jindal teaches grouping multiple servers into first and second server groups, wherein said first server group has a load level less than a load level of said second server group (col. 9, line 48 to col. 10, line 40) calculating a time period T (col. 2 lines 40-67; col. 4, lines 57-67; col. 6, lines 35-64; col. 8, lines 1-7 and 47-54; and col. 9, line 14-27), assigning load to a server selected from a group of servers comprising said first server group from an initial time until expiration of said time period T (col. 4, lines 57-67; col. 6, lines 35-64; and col. 9, line 14-27), determining another group of servers comprising said group of servers that includes said first server group and further comprising said second server group (col. 8, line 55 to col. 10, line 40), and assigning load to a server selected from said another group of servers after expiration of said time period T (col. 4, lines 57-67; col. 6, lines 35-64; col. 8, lines 1-7 and 47-54; and col. 9, line 14-27).

The appellants respectfully disagree with the Examiner's interpretation of Jindal. Jindal teaches a selection and subsequent re-selection of a server from a same group of servers. That is, Jindal teaches a central server that periodically determines a server from a same group of servers to be the "preferred" server to which client requests are routed. In order to select the preferred server, the central server periodically collects one or more items of information concerning each server in the group, such as a number of clients being serviced by the server at that moment, a number of client requests handled by the

server in a predetermined period of time, and a distance of the server from the central server. Based on the collected information, the central server then selects a server from the group of servers to be the preferred server. The group of servers may comprise multiple servers directly connected to the central server (servers 110, 112, and 114 in FIG. 2), or the group of servers may comprise multiple servers that are indirectly connected to the central server (servers 302, 304, 312, and 314, which are connected to central server 100 via intermediate servers 306 and 316 in FIG. 3, that is, the 'server farms' referenced by the Examiner in the Advisory Action). However, in both instances, at each server selection point the preferred server is selected by the central server from the same group of servers. Thus load balancing is performed not by varying the groups of servers analyzed but instead by periodically analyzing each server in a same group of servers.

In the Advisory Action, the Examiner referenced column 10, lines 32-40, of Jindal as teaching the segregation of servers into multiple groups. The appellants respectfully disagree. In this section of Jindal, Jindal merely teaches that the server group may comprise individual, participating servers ('segregated' servers) distributed among separate 'server farms,' rather than all the servers of each of one or more 'farms.' These individual servers may be considered something of a virtual group. Jindal then teaches that each farm, upon receiving a load allocation for the participating servers of that farm and which load allocation is based on a 'global' load distribution policy, may then distribute load to the participating servers of that farm based on a different load distribution policy than the 'global' load distribution policy. However, again, at each selection point, the load is being distributed among the same participating servers, that is, among the members of the virtual group.

By contrast, claim 1 teaches load balancing by varying the groups of servers considered. That is, claim 1 teaches grouping multiple servers into a first and second server groups, assigning load to a server selected from a group of servers comprising the first server group from an initial time until expiration of a time period T, determining another group of servers comprising the group of servers that includes the first server group and further comprising the second server group, and assigning load to a server

selected from the another group of servers after expiration of the time period T. Nowhere does Jindal teach such load balancing. Accordingly, the appellants respectfully submit that claim 1 is not unpatentable over the prior art of record.

Each of claims 2-4 includes limitations of assigning load to a server selected from a group of servers comprising a first server group from an initial time until expiration of said time period T, determining multiple other groups of servers comprising the group of servers that includes the first server group and further comprising another server group of multiple other servers groups, and assigning load to a server selected from a group of servers of the multiple other groups of servers after expiration of said time period T. As noted above, none of these limitations are taught by Jindal. Accordingly, the appellants respectfully submit that claims 2-4 are not unpatentable over the prior art of record.

Regarding dependent claims 5-14, because claims 5-14 depend directly or indirectly from independent claim 4, the appellants respectfully submit that claims 5-14 are not unpatentable over the prior art of record.

(iv) Rejection under 35 U.S.C. §103:

None.

(v) Other rejections

None.

8. CONCLUSION

For the above reasons, the appellants respectfully submit that the rejection of claims 1-14 under 35 U.S.C. §102(e) as being upatentable over Jindal is in error and should be reversed and the claims allowed.

Respectfully submitted,

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By: _____

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CLAIMS APPENDIX

1. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a first and second server groups, wherein said first server group has a load level less than a load level of said second server group;

calculating a time period T;

assigning load to a server selected from a group of servers comprising said first server group from an initial time until expiration of said time period T;

determining another group of servers comprising said group of servers that includes said first server group and further comprising said second server group; and

assigning load to a server selected from said another group of servers after expiration of said time period T.

2. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through G2, wherein server groups G0 through G2 respectively have load levels progressively from a least amount of load level to a most amount of load level;

calculating time periods T1 and T2, wherein said time period T2 is longer than said time period T1;

assigning load to a server selected from a group of servers comprising said server group G0 from an initial time until expiration of said time period T1;

determining another group of servers comprising said group of servers that includes said server group G0 and further comprising said server group G1;

assigning load to a server selected from said another group of servers after expiration of said time period T1;

determining yet another group of servers comprising said group of servers that includes said another group of servers and further comprising said server group G2; and

assigning load to a server selected from said yet another group of servers after expiration of said time period T2.

3. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through Gk, wherein said server groups G0 through Gk respectively have load levels progressively from a least amount of load level to a most amount of load level;

calculating a plurality of time periods T1 through Tk;

assigning load to a server selected from servers in said server group G0 from an initial time until expiration of said time period T1;

determining a plurality of other groups of servers, wherein each group of servers of said plurality of other groups of servers comprises said group of servers that includes said server group G0 and further comprises at least one other server group selected from said server groups G1 through Gk; and

assigning load, after expiration of each of said time periods T1 through Tk measured from said initial time, to a server selected from a group of servers of the plurality of other groups of servers.

4. In a communication system network having a plurality of servers, each of said plurality of servers having a load level based on serving a number of clients in said communication system network, a method comprising the steps of:

grouping said plurality of servers into a plurality of server groups G0 through Gk, wherein said server groups G0 through Gk respectively have load levels from progressively a least amount of load level to a most amount of load level;

calculating a plurality of time periods T1 through Tk corresponding to said server groups G1 through Gk;

assigning load to a server selected from servers in said server group G0 from an initial time until expiration of said time period T1;

determining a plurality of other groups of servers, wherein each group of servers of said plurality of other groups of servers comprises said group of servers that includes said server group G0 and further comprises at least one other server group selected from said server groups G1 through Gk; and

assigning load, after expiration of each of said time periods T1 through Tk measured from said initial time, to a server selected from a group of servers of the plurality of other groups of servers, wherein each group of servers of said other groups of servers corresponds to an expiring time period.

5. The method as recited in claim 4 wherein said plurality of time periods T1 through Tk each is based on a difference between load levels of at least two server groups in said plurality of server groups G0 through Gk.

6. The method as recited in claim 4 further comprising the step of:

receiving an update of load level of at least one of said plurality of servers in said plurality of server groups G0 through Gk;

repeating said grouping to produce a new plurality of server groups G0 through Gk based on said update of load level;

repeating said calculating said plurality of time periods to produce a new plurality of time periods T1 through Tk corresponding to said new plurality of server groups G0 through Gk;

resetting said initial time to a reset initial time, and assigning load to a server selected from servers in said new server group G0 from said reset initial time until expiration of said new time period T1;

assigning load, after expiration of each of said new time periods T1 through Tk measured from said reset initial time, to a server selected from servers in a combination of servers including said new server group G0 and at least one other server group, in said new server groups G1 through Gk, corresponding to an expiring time period.

7. The method as recited in claim 4 wherein said grouping of said plurality of server groups G0 through Gk is based on similarity of load levels among said plurality of servers.

8. The method as recited in claim 4 wherein at least one load assignment in said assigning load to a server in said server group G0 and said assigning load to a server selected from a group of servers of the plurality of other groups of servers is performed according to a round robin selection method.

9. The method as recited in claim 4 wherein at least one load assignment in said assigning load to a server in said server group G0 and said assigning load to a server selected from a group of servers of the plurality of other groups of servers is performed according to a random selection method.

10. The method as recited in claim 4 wherein each of said plurality of time periods T1 through Tk is based on load levels of at least two server groups selected from said plurality of server groups G0 through Gk, a request arrival rate and a server service rate.

11. The method as recited in claim 10 wherein said request arrival rate is substituted for an average request arrival rate of said plurality of servers.

12. The method as recited in claim 10 wherein said request arrival rate is substituted for an average request arrival rate of a combination of servers of said plurality of servers.

13. The method as recited in claim 10 wherein said server service rate is substituted for an average service rate of said plurality of servers.

14. The method as recited in claim 10 wherein said server service rate is substituted for an average service rate of a combination of servers of said plurality of servers.

EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132, nor has any other evidence been entered by the Examiner and relied upon by the appellant.

RELATED PROCEEDINGS APPENDIX

The appellants and appellants' representative know of no other appeal, interference, or judicial proceeding that may be related to, directly affect or be directly affected by, or have a bearing upon the Board's decision in the pending appeal.